

**§ 98.87 Records that must be retained.**

(a) If a CEMS is used to measure CO<sub>2</sub> emissions, then in addition to the records required by § 98.3(g), you must retain under this subpart the records required for the Tier 4 Calculation Methodology in § 98.37.

(b) If a CEMS is not used to measure CO<sub>2</sub> emissions, then in addition to the records required by § 98.3(g), you must retain the records specified in this paragraph (b) for each portland cement manufacturing facility.

(1) Documentation of monthly calculated kiln-specific clinker CO<sub>2</sub> emission factor.

(2) Documentation of quarterly calculated kiln-specific CKD CO<sub>2</sub> emission factor.

(3) Measurements, records and calculations used to determine reported parameters.

[75 FR 66461, Oct. 28, 2010]

**§ 98.88 Definitions.**

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

## Subpart I—Electronics Manufacturing

SOURCE: 75 FR 74818, Dec. 1, 2010, unless otherwise noted.

**§ 98.90 Definition of the source category.**

(a) The electronics manufacturing source category consists of any of the production processes listed in paragraphs (a)(1) through (a)(5) of this section that use fluorinated GHGs or N<sub>2</sub>O. Facilities that may use these processes include, but are not limited to, facilities that manufacture micro-electro-mechanical systems (MEMS), liquid crystal displays (LCDs), photovoltaic cells (PV), and semiconductors (including light-emitting diodes (LEDs)).

(1) Any electronics production process in which the etching process uses plasma-generated fluorine atoms and other reactive fluorine-containing fragments, that chemically react with exposed thin-films (e.g., dielectric, metals) or substrate (e.g., silicon) to selectively remove portions of material.

(2) Any electronics production process in which chambers used for depositing thin films are cleaned periodically using plasma-generated fluorine atoms and other reactive fluorine-containing fragments.

(3) Any electronics production process in which wafers are cleaned using plasma generated fluorine atoms or other reactive fluorine-containing fragments to remove residual material from wafer surfaces, including the wafer edge.

(4) Any electronics production process in which the chemical vapor deposition (CVD) process or other manufacturing processes use N<sub>2</sub>O.

(5) Any electronics manufacturing production process in which fluorinated heat transfer fluids are used to cool process equipment, to control temperature during device testing, to clean substrate surfaces and other parts, and for soldering (e.g., vapor phase reflow).

[75 FR 74818, Dec. 1, 2010, as amended at 77 FR 10380, Feb. 22, 2012]

**§ 98.91 Reporting threshold.**

(a) You must report GHG emissions under this subpart if electronics manufacturing production processes, as defined in § 98.90, are performed at your facility and your facility meets the requirements of either § 98.2(a)(1) or (a)(2). To calculate total annual GHG emissions for comparison to the 25,000 metric ton CO<sub>2</sub>e per year emission threshold in § 98.2(a)(2), follow the requirements of § 98.2(b), with one exception. Rather than using the calculation methodologies in § 98.93 to calculate emissions from electronics manufacturing production processes, calculate emissions of each fluorinated GHG from electronics manufacturing production processes by using paragraphs (a)(1), (a)(2), or (a)(3) of this section, as appropriate, and then sum the emissions of each fluorinated GHG by using paragraph (a)(4) of this section.

(1) If you manufacture semiconductors or MEMS you must calculate annual production process emissions of each input gas *i* for threshold applicability purposes using the default emission factors shown in Table I-1 to this subpart and Equation I-1 of this subpart.

$$E_i = S * EF_i * GWP_i * 0.001 \quad (\text{Eq. I-1})$$

where:

$E_i$  = Annual production process emissions of input gas  $i$  for threshold applicability purposes (metric tons CO<sub>2</sub>e).

$S$  = 100 percent of annual manufacturing capacity of a facility as calculated using Equation I-5 of this subpart (m<sup>2</sup>).

$EF_i$  = Emission factor for input gas  $i$  (kg/m<sup>2</sup>).

$GWP_i$  = Gas-appropriate GWP as provided in Table A-1 to subpart A of this part.

0.001 = Conversion factor from kg to metric tons.

$i$  = Input gas.

(2) If you manufacture LCDs, you must calculate annual production process emissions of each input gas  $i$  for threshold applicability purposes using the default emission factors shown in Table I-1 to this subpart and Equation I-2 of this subpart.

$$E_i = S * EF_i * GWP_i * 0.000001 \quad (\text{Eq. I-2})$$

where:

$E_i$  = Annual production process emissions of input gas  $i$  for threshold applicability purposes (metric tons CO<sub>2</sub>e).

$S$  = 100 percent of annual manufacturing capacity of a facility as calculated using Equation I-5 of this subpart (m<sup>2</sup>).

$EF_i$  = Emission factor for input gas  $i$  (g/m<sup>2</sup>).

$GWP_i$  = Gas-appropriate GWP as provided in Table A-1 to subpart A of this part.

0.000001 = Conversion factor from g to metric tons.

$i$  = Input gas.

(3) If you manufacture PVs, you must calculate annual production process emissions of each input gas  $i$  for threshold applicability purposes using gas-appropriate GWP values shown in Table A-1 to subpart A of this part and Equation I-3 of this subpart.

$$E_i = C_i * GWP_i * 0.001 \quad (\text{Eq. I-3})$$

where:

$E_i$  = Annual production process emissions of input gas  $i$  for threshold applicability purposes (metric tons CO<sub>2</sub>e).

$C_i$  = Annual fluorinated GHG (input gas  $i$ ) purchases or consumption (kg). Only gases that are used in PV manufacturing processes listed at § 98.90(a)(1) through (a)(4) that have listed GWP values in Table A-1 to subpart A of this part must

be considered for threshold applicability purposes.

$GWP_i$  = Gas-appropriate GWP as provided in Table A-1 to subpart A of this part.

0.001 = Conversion factor from kg to metric tons.

$i$  = Input gas.

(4) You must calculate total annual production process emissions for threshold applicability purposes using Equation I-4 of this subpart.

$$E_T = \delta * \sum_i E_i \quad (\text{Eq. I-4})$$

where:

$E_T$  = Annual production process emissions of all fluorinated GHGs for threshold applicability purposes (metric tons CO<sub>2</sub>e).

$\delta$  = Factor accounting for fluorinated heat transfer fluid emissions, estimated as 10 percent of total annual production process emissions at a semiconductor facility. Set equal to 1.1 when Equation I-4 of

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this subpart is used to calculate total annual production process emissions from semiconductor manufacturing. Set equal to 1 when Equation I-4 of this subpart is used to calculate total annual production process emissions from MEMS, LCD, or PV manufacturing.

$E_i$  = Annual production process emissions of input gas  $i$  for threshold applicability

purposes (metric tons  $\text{CO}_2\text{e}$ ), as calculated in Equations I-1, I-2 or I-3 of this subpart.

$i$  = Input gas.

(b) You must calculate annual manufacturing capacity of a facility using Equation I-5 of this subpart.

$$S = \sum_x^{12} W_x \quad (\text{Eq. I-5})$$

where:

$S$  = 100 percent of annual manufacturing capacity of a facility ( $\text{m}^2$ ).

$W_x$  = Maximum substrate starts of fab  $f$  in month  $x$  ( $\text{m}^2$  per month).

$x$  = Month.

[75 FR 74818, Dec. 1, 2010, as amended at 77 FR 10380, Feb. 22, 2012; 78 FR 68202, Nov. 13, 2013]

### § 98.92 GHGs to report.

(a) You must report emissions of fluorinated GHGs (as defined in § 98.6),  $\text{N}_2\text{O}$ , and fluorinated heat transfer fluids (as defined in § 98.98). The fluorinated GHGs and fluorinated heat transfer fluids that are emitted from electronics manufacturing production processes include, but are not limited to, those listed in Table I-2 to this subpart. You must individually report, as appropriate:

(1) Fluorinated GHGs emitted.

(2)–(3) [Reserved]

(4)  $\text{N}_2\text{O}$  emitted from chemical vapor deposition and other electronics manufacturing processes.

(5) Emissions of fluorinated heat transfer fluids.

(6) All fluorinated GHGs and  $\text{N}_2\text{O}$  consumed.

(b)  $\text{CO}_2$ ,  $\text{CH}_4$ , and  $\text{N}_2\text{O}$  combustion emissions from each stationary combustion unit. You must calculate and report these emissions under subpart C of this part (General Stationary Fuel

Combustion Sources) by following the requirements of subpart C of this part.

[75 FR 74818, Dec. 1, 2010, as amended at 77 FR 10380, Feb. 22, 2012; 78 FR 68202, Nov. 13, 2013]

### § 98.93 Calculating GHG emissions.

(a) You must calculate total annual emissions of each fluorinated GHG emitted by electronics manufacturing production processes from each fab (as defined in § 98.98) at your facility, including each input gas and each by-product gas. You must use either default gas utilization rates and by-product formations rates according to the procedures in paragraph (a)(1), (a)(2), or (a)(6) of this section, as appropriate, or the stack test method according to paragraph (i) of this section, to calculate emissions of each input gas and each by-product gas.

(1) If you manufacture semiconductors, you must adhere to the procedures in paragraphs (a)(2)(i) through (iii) of this section. You must calculate annual emissions of each input gas and of each by-product gas using Equations I-6 and I-7, respectively. If your fab uses less than 50 kg of a fluorinated GHG in one reporting year, you may calculate emissions as equal to your fab's annual consumption for that specific gas as calculated in Equation I-11 of this subpart, plus any by-product emissions of that gas calculated under this paragraph (a).